

**7-C**  
**UNOCAL SITE SENSITIVE  
AREAS TECHNICAL REPORT**

**FINAL  
ENVIRONMENTAL  
IMPACT STATEMENT**

**Brightwater  
Regional Wastewater  
Treatment System**

**APPENDICES**

**Final**

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# **Appendix 7-C Unocal Site Sensitive Areas Technical Report**

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## Executive Summary

Adolfson Associates, Inc. (Adolfson) conducted sensitive area studies and prepared this technical report for a 53-acre site located between State Route (SR) 104 and the Edmonds Marina in the City of Edmonds, Washington. This site is one of two sites being considered by the King County Wastewater Treatment Division for development as a new regional secondary wastewater treatment plant. This property is referred to as the Unocal site in the *Draft Environmental Impact Statement: Brightwater Regional Wastewater Treatment System November 2002* (King County, 2002a).

The Draft EIS evaluated the probable significant adverse environmental impacts and mitigation measures at two treatment plant sites, the Route 9 and Unocal sites. The Final EIS responds to comments on both plant sites and provides more detailed analysis on both the Unocal and Route 9 treatment plant sites. Prior to issuance of the Final EIS, King County is providing in this report more detailed information on sensitive areas at the Unocal Site.

The site is owned by the Unocal Corporation, an international oil and natural gas exploration and production company. The central portion of the site is developed with formerly used storage tanks, gravel areas, and a few small buildings. The Edmonds Marsh extends onto the site from the northeast; portions of Willow Creek and Shelleberger Creek are also located within the northeast site boundary. Upland forest areas are located on the slope between Puget Sound and the site's former storage tank sites, and between and east of the tank sites.

Overall, the site contains approximately 25 acres of vegetated habitat. Seven main habitat types were identified on the site during field surveys. These include: 1) developed areas; 2) upland forest, shrub, and grassland; 3) forested/scrub-shrub wetland and riparian; 4) emergent wetland; 5) open water; 6) salt marsh; and 7) marine nearshore habitat types.

Three wetlands are located on the site: Wetland A, Edmonds Marsh (most of this marsh is outside the site boundaries); Wetland B, a stormwater detention pond separated from the Edmonds Marsh by a berm; and Wetland C, a side slope seep wetland located on the hillslope above the existing Unocal offices. Two streams (Willow Creek and Shelleberger Creek) are located immediately within the northeast and northwest site boundaries.

The site's wetlands were rated in accordance with both Edmonds Municipal Development Code and the Washington State Department of Ecology Rating System for Western Washington. Wetland A is rated as a Category 1 wetland, while Wetlands B and C are rated as Category 3 wetlands using these rating systems. Both streams are rated as Category 2 according to Edmonds Municipal Development Code.

Up to 25 special status wildlife species may occur on the site; however, only 11 are expected to occur on the site. Special status species include species designated by federal or state government agencies as endangered, threatened, proposed, candidate, sensitive, and monitor and species of local importance. Five of these species, the bald eagle, marbled murrelet, Steller's sea lion, Puget Sound chinook salmon, and bull trout, are federal threatened species.

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## Introduction

King County has prepared a Draft Environmental Impact Statement (Draft EIS) and Final Environmental Impact Statement (Final EIS) on the Brightwater Regional Wastewater Treatment System. The Final EIS is intended to provide decision-makers, regulatory agencies and the public with information regarding the probable significant adverse impacts of the Brightwater proposal and identify alternatives and reasonable mitigation measures.

King County Executive Ron Sims has identified a preferred alternative, which is outlined in the Final EIS. This preferred alternative is for public information only, and is not intended in any way to prejudice the County's final decision, which will be made following the issuance of the Final EIS with accompanying technical appendices, comments on the Draft EIS and responses from King County, and additional supporting information. After issuance of the Final EIS, the King County Executive will select final locations for a treatment plant, marine outfall and associated conveyances.

The County Executive authorized the preparation of a set of Technical Reports, in support of the Final EIS. These reports represent a substantial volume of additional investigation on the identified Brightwater alternatives, as appropriate, to identify probable significant adverse environmental impacts as required by the State Environmental Policy Act (SEPA). The collection of pertinent information and evaluation of impacts and mitigation measures on the Brightwater proposal is an ongoing process. The Final EIS incorporates this updated information and additional analysis of the probable significant adverse environmental impacts of the Brightwater alternatives, along with identification of reasonable mitigation measures. Additional evaluation will continue as part of meeting federal, state and local permitting requirements.

Thus, the readers of this Technical Report should take into account the preliminary nature of the data contained herein, as well as the fact that new information relating to Brightwater may become available as the permit process gets underway. It is released at this time as part of King County's commitment to share information with the public as it is being developed.

Adolfson Associates, Inc. (Adolfson) conducted sensitive areas studies and prepared this technical report for the 53-acre site located in the City of Edmonds, Washington, hereafter referred to as the Unocal site (Figure 1). This site is one of the two sites proposed by the King County Wastewater Treatment Division (WTD) for development of a new regional secondary wastewater treatment plant. This technical report is intended to supplement the information in Chapter 7, Plants and Animals, of the Final EIS. This property is referred to as the Unocal site in the *Draft Environmental Impact Statement: Brightwater Regional Wastewater Treatment System November 2002* (King County, 2002a).

The following sections describe the site and document existing habitat, stream, and wetland conditions. The report also notes documented presence of "special status" species on the site, which include federal and state endangered, threatened, proposed, candidate, sensitive, and monitor and species of local importance. Figures and photographs are provided following the text of this report.

## Site Description

The proposed 53-acre Unocal site is located between State Route (SR) 104 and the Edmonds Marina in the City of Edmonds, Washington. The site is owned by the Unocal Corporation, an international oil and natural gas exploration and production company. The central portion of the site is developed with formerly used storage tanks, gravel areas, and a few small buildings. The Edmonds Marsh extends onto the site from the northeast; portions of Willow Creek and Shelleberger Creek are also located within the northeast site boundary. Upland forest areas are located on the slope between Puget Sound and the site's former storage tank sites, and between and east of the tank sites. Overall, the site contains approximately 25 acres of vegetated habitat. Figure 1 illustrates the site.

## Methods

### Review of Existing Documentation

Existing sensitive areas including wetlands, streams, and fish and wildlife habitats at the Unocal site were characterized using database information and aerial photography (King County, 2002b). Existing database information was derived from the U.S. Fish and Wildlife Service (USFWS, 2003), Washington State Department of Natural Resources (WA DNR, 2002), Washington State Department of Fish and Wildlife (WDFW, 2003), the *Draft City of Edmonds Wetland Inventory* (Sheldon & Associates, 1992). Site information from the *Edmonds Crossing Draft Discipline Report for Wetlands* (Adolfson, 1995) and the *Edmonds Crossing Discipline Report for Vegetation, Fisheries, and Wildlife* (CH2M HILL and Adolfson Associates, 1995) were also used for this assessment.

### Field Investigation

Field studies were conducted on April 11, May 14 and 30, and July 10, 2002. Adolfson delineated wetlands on the site on May 14 and 30 and July 10, 2002. Figures and photographs are located at the end of this report.

Habitat assessment methods described in *Wildlife–Habitat Relationships in Oregon and Washington* (Johnson and O'Neil, 2001) were used to describe and evaluate habitat types. Methods defined in the *Washington State Wetlands Identification and Delineation Manual* (Ecology, 1997), a manual consistent with the *Corps of Engineers Wetlands Delineation Manual* ("1987 Manual") (Environmental Laboratory, 1987) were used to determine the presence and extent of wetlands on the project site. Wetland functions and values were assessed using the methodology presented in *Wetland Functions Characterization Tool for Linear Projects* (Null et al., 2000). Onsite streams were identified in accordance with the definition described in Edmonds Community Development Code (ECDC) Chapter 20.15B.020. Physical characteristics recorded included channel width, channel depth, streamside riparian structure, large woody debris composition, and substrate conditions.

## Findings

Historically, the Unocal site likely consisted of upland forest on the slopes, and salt marsh and emergent, scrub-shrub, and forested wetlands on the flatter north and east portions of the site. From 1923 to 1991 the Unocal site was used as a bulk fuel terminal for storing, blending, and distributing petroleum products. The north portion of the site was used for asphalt production between 1953 and the late 1970s. Unocal developed approximately 28 acres of the site, which now contains the sites of former storage tanks, a large gravel lot, paved roads, and several office buildings (Photo 1). Abandoned oil tanks and underground storage tanks were removed from the site in 2001. Site clean up of petroleum contaminated soils and groundwater in accordance with an agreement between Unocal and Ecology has been ongoing since 2001.

The Edmonds Marsh, a 23-acre regionally recognized wetland system with freshwater and estuarine habitats, is located on and adjacent to the Unocal site. The WDFW database documented the presence of great blue heron nests on the site at two different locations in the late 1990s, one on a forested slope above the marsh and one in the Edmond Marsh itself (WDFW, 2003). Bald eagle nests are located approximately 0.5 mile south and 1.5 miles north of the site (WDFW, 2003). Willow Creek and Shelleberger Creek contain priority anadromous fish species.

## Habitat Types

Several habitat types are found on the 53-acre Unocal site (Figure 1). These habitat types, listed below in order of coverage on the site, include developed areas, upland habitats, wetland habitats, and streams. The marine environment is covered in the outfall section in Chapter 7 of the Final EIS. Habitat types on the site include:

- Developed areas (53percent of site)
- Upland forest and shrub (33.3percent of site)
- Forested/scrub-shrub wetland and riparian (6.3percent of site)
- Emergent wetland (1.7percent of site)
- Open water wetland (0.2percent of site)
- Saltwater marsh (1.8percent of site)
- Marine nearshore (3.7percent of site)
- Streams

Each habitat type is described in greater detail below.

## **Developed Areas**

Developed portions of the Unocal site (28 acres total) are composed primarily of former tank sites (gravelly areas) with some buildings and a gravel lot in the lower yard on the north portion of the site (Photo 1). Developed areas on the site also include Marina Beach Park, owned by the City of Edmonds, west of the railroad tracks. Invasive, non-native plant species such as Scot's broom, English ivy, and Himalayan blackberry are found along the edges of the former tank sites and gravel lot area. Non-native grasses dominate the vegetation in Marina Beach Park. Soils are compacted and consist largely of gravel fill. Wildlife species and tracks observed in April and May 2002 included raccoon, violet-green swallow, house sparrow, American robin, killdeer, Canada goose, American crow and gull species.

## **Upland Forest and Shrub**

Upland forest covers approximately 15 acres of the site. Upland forest provides habitat to a variety of native wildlife species on the south portion of the site on steep slopes between Puget Sound shoreline and between the former tank sites and the Deer Creek Hatchery. These upland forests are dominated by hardwood (deciduous) trees on the slope above the shoreline, and by a mix of deciduous and coniferous trees in other forest areas (Figure 1, Photo 2). Dominant trees and shrubs include big leaf maple, red alder, western red cedar, Douglas fir, Indian plum, hazelnut, and red elderberry. Common associated shrubs and herbs include salmonberry, ocean spray, stinging nettle, and sword fern. Himalayan blackberry, a non-native invasive species, is prevalent in some areas. The forested slope above Puget Sound is part of a larger wildlife movement corridor along Puget Sound. Wildlife species or their sign (burrows, scat, excavations, etc.) observed in upland forest on the site included mountain beaver, American robin, Bewick's wren, black-capped chickadee, chestnut-backed chickadee, winter wren, pileated woodpecker, and red-breasted nuthatch. Bald eagles and belted kingfishers are known to perch in trees near the shoreline.

Upland shrub habitats cover approximately 2.6 acres of the site. Upland shrub habitat dominated by non-native Scot's broom is located between the shoreline and the forested slope (Photo 3) and along the berm separating the Edmonds Marsh (Wetland A) from Wetland B (stormwater detention ponds). Likely inhabitants of these shrub communities include white-crowned sparrow, American robin, and song sparrow.

## **Wetland Habitats**

Three wetlands were identified on the Unocal site: Wetland A, Edmonds Marsh (most of this marsh is outside the site boundaries); Wetland B, a stormwater detention pond separated from the Edmonds Marsh by a berm; and Wetland C, a side slope seep wetland located on the hillslope above the existing Unocal offices. Wetland hydrology, soils, vegetation, classifications, ratings, and buffers are summarized in Table 1.

**Table 1. Wetland Descriptions and Classifications**

<b>Wetland</b>	<b>Wetland Size (Acres)</b>	<b>Hydro-Geomorphic Classification</b>	<b>Associated Streams</b>	<b>Cowardin ClassA</b>	<b>Ecology RatingB (Cat.)</b>	<b>City of Edmonds Rating</b>	<b>City of Edmonds Buffer (ft)</b>	<b>Vegetation (dominant species)</b>	<b>Mapped Soil TypeC</b>	<b>Observed Soil Type</b>
A	2.85 onsite only	Depressional outflow	Willow Creek, Shelleberger Creek	EEM, PEM, PSS, PFO	I	1	100	American three-square, fleshy jaumea, Pacific silverweed, saltgrass, cattail, red alder, Scouler's willow, black cottonwood, salmonberry	Mukilteo muck, Alderwood and Everett gravelly sandy loam	muck, silt loam
B	2.3	Depressional outflow	Outlets to Willow Creek	POW, PEM, PSS	III	3	25	Cattail, bentgrass, purple loostrife, American three square, willow, Douglas spiraea	Urban Land 1 Soils	sandy loam containing construction debris
C	0.02	Slope		PSS	III	3	25	Salmonberry, giant horsetail, Watson's willow herb, Himalayan blackberry	Alderwood gravelly sandy loam	silty clay

A Wetland Classifications (Cowardin et. al., 1979): EEM-Estuarine Emergent, PEM-Palustrine Emergent, POW – Palustrine Open Water, PSS-Palustrine Scrub Shrub, PFO-Palustrine Forest

B Washington State Department of Ecology's *Wetland Rating Systems: for Western Washington, Second Edition*. August 1993. Publication #93-74.

C Soils from *Soil Survey of Snohomish County Area Washington*. Debose and Klungland. 1983.

### Wetland A - Edmonds Marsh

Approximately 2.85 acres of the 23-acre Edmonds Marsh extends onto the Unocal site (Photo 4). In 1981, the City of Edmonds established the Edmonds Marsh as a Wildlife Habitat and Natural Resource Sanctuary (Adolfson, 1995). The original 40-acre marsh was reduced in size by filling, and from 1960 until 1989, a tide gate prevented salt water from entering the wetland, changing the vegetation community from salt marsh to palustrine emergent (CH2M Hill and Adolfson, 1995). Since 1989 when the tide gate was permanently opened, the salt marsh vegetation has been recolonizing the areas influenced by tides (Photo 5). Willow Creek and Shelleberger Creek flow through Edmonds Marsh and provide freshwater flows to the wetland.

The marsh consists of saltwater marsh, palustrine emergent, and forested/scrub-shrub habitat types (Figure 1). The salt marsh habitat type is dominated by American three-square, fleshy jaumea, Pacific silverweed, salt marsh bulrush, saltgrass, brass buttons, and soft rush. The palustrine emergent habitat type is dominated by common cattail, purple loosestrife (a state-listed noxious weed) and hard-stem bulrush. Other invasive species observed at the southwestern fringe of the wetland include Himalayan blackberry, Japanese knotweed, and Scot's broom. Forested/scrub-shrub habitat is composed of red alder, black cottonwood, western red cedar, Scouler's willow, salmonberry, lady fern, creeping buttercup, reed canarygrass, youth-on-age, and skunk cabbage (Photo 6).

The Edmonds Marsh performs many functions. The diversity of habitat types, from salt marsh to fresh water emergent and forested vegetation communities provides, habitats to many wildlife species. Wildlife species observed in the Edmonds Marsh during the field surveys included American goldfinch, white-crowned sparrow, great blue heron, American crow, house sparrow, American robin, red-winged blackbird, mallard, killdeer, gull species, Canada goose, and Pacific chorus frog. Willow Creek and Shelleberger Creek provide fish habitat in the wetland. The large size of the marsh, combined with dense vegetation and its position in the landscape, gives it high capacity for flood flow alteration and water quality treatment. Organic matter is produced and exported directly to Puget Sound. It has high educational and heritage value, being positioned along the waterfront adjacent to a public park and in the midst of downtown Edmonds.

### Wetland B - Detention Pond 1

Wetland B, a constructed detention pond facility, is located at the northwest corner of the Unocal site (Figure 1, Photo 7). This 2.3-acre wetland is separated from the Edmonds Marsh by a constructed berm. Wetland B (also referred to as Detention Pond 1) was created in 1952 to collect stormwater from the Unocal property (CH2M HILL and Adolfson, 1995). Wetland B receives stormwater from the Unocal site, and water levels fluctuate rapidly during the rainy season. The detention pond drains via a culvert to Willow Creek located along the Burlington Northern-Santa Fe (BNSF) railroad tracks. Wetland B also receives water from a PVC-lined basin (Detention Pond 2) located immediately southwest of Wetland B during heavy precipitation events. There are three habitat types in this wetland: palustrine open water, emergent, and scrub-shrub (Photo 7). Emergent vegetation includes common cattail, bentgrass, purple loosestrife (a noxious weed), and American three-square. Dominant shrubs include Douglas spiraea and willow.

The principal functions of Wetland B include flood flow alteration and water quality treatment because it was designed for these purposes and it contains dense vegetation and relatively large water storage capacity for its size. Though it does provide some open water, emergent, and scrub-shrub habitat areas for wildlife, the vegetation communities are not diverse and are not directly connected to streams and the greater Edmonds Marsh system.

### **Wetland C – Side Slope Seep**

The steep forested slope located above Puget Sound on the site contains a 0.02-acre side slope seep wetland (Photo 8). The wetland is located directly below the former location of the petroleum product storage tanks on the site (Figure 1). This wetland is a palustrine scrub-shrub wetland that is dominated by giant horsetail and salmonberry. The wetland is fed by a groundwater seep. Surface water from Wetland C flows down the slope through a partially eroded channel to the base of the slope where surface water is then directed towards the BNSF railroad corridor.

Wetland C provides groundwater discharge to the slope; groundwater discharge is its principal function. Wetland C serves as a water source for wildlife species inhabiting the surrounding upland forest, and it produces organic matter that is exported down the forested slope.

## **Streams**

Two small perennial streams (Willow Creek and Shelleberger Creek) flow through the Edmonds Marsh on the site. Both streams are classified by ECDC 21.15B.060 as Category 2 streams because they are perennial. Willow Creek flows in an open channel immediately within the northeast and northwest site boundaries and it flows through a long culvert right before entering Puget Sound (Figure 1). Shelleberger Creek flows into Willow Creek on the site near the east site boundary. Deer Creek Hatchery is located on Willow Creek within the east site boundary.

### **Deer Creek Hatchery**

The Deer Creek Hatchery on Willow Creek is located near the intersection of Pine Street and SR 104 on land leased from Unocal. The hatchery started operation in 1985 and is maintained by the Washington Council of Trout Unlimited under the supervision of the WDFW. Diversions from Willow Creek are the sole source of water for the hatchery, which only operates seasonally in the winter and spring when temperatures are lowest and water quality in Willow Creek is best. The hatchery produced approximately 120,000 juvenile salmonids per year between 1986 and 1991, producing both chinook and coho salmon fry that were then outplanted (stocked) in local streams. In those years, eyed chinook eggs were donated by the Soos Creek Hatchery and raised at the Deer Creek Hatchery.

Presently, only coho salmon are produced at the hatchery (Thompson, personal communication, 2002). Coho eggs are produced from brood stock at the WDFW Issaquah Hatchery in the City of Issaquah, Washington. The Deer Creek Hatchery does not operate its own brood stock program and does not take adult fish from Willow Creek for use in hatchery operations. Coho are raised until June when the fish are outplanted into North Creek and Swamp Creek, tributaries to the Sammamish River in the Lake Washington Basin. There are no intentional on-site releases,

although approximately 4 to 5 percent of the juvenile coho are thought to escape from the pond through the overflow pipe (Thompson, personal communication, 2002). During the site reconnaissance investigation conducted in May 2002, numerous juvenile coho salmon were observed in Willow Creek in proximity to the hatchery outfall pipe.

Each year the coho rearing at the Deer Creek Hatchery is completed by the second week of June as a result of high summer water temperatures in the pond and water quality problems. Water temperatures within Willow Creek range from 48 to 55 degrees F during the winter and spring and increase to as much as 70 degrees F in the summer. One fish kill has also been recorded at the hatchery that was connected to the dumping of fertilizers in the upper basin (Thompson, personal communication, 2002).

### Willow Creek

Willow Creek originates in a residential area near SR-104 and 6th Avenue and it flows under SR-104 into the Edmonds Marsh. Within and adjacent to the Unocal site, Willow Creek offers relatively limited spawning and freshwater rearing habitat for fish (Photo 9). For the purposes of this stream habitat description, Willow Creek is divided into three reaches: the reach between Puget Sound and the southeast end of Detention Pond 1, the reach between the southeast end of Detention Pond 1 and Deer Creek Hatchery, and the remainder of the stream to Pine Street upstream of the Deer Creek Hatchery.

Within the first reach from the mouth of Willow Creek to the southeast end of Detention Pond 1, the stream is tidally influenced and channelized with a sand, mud, and muck bottom and little instream cover (Photo 9). Willow Creek flows through an approximately 1,275-foot-long culvert beneath the park and Edmonds Marina parking area before entering Puget Sound.

In the second stream reach from Detention Pond 1 to Deer Creek Hatchery, vegetation cover increases. The sand-bottomed, channelized stream is lined with cattails, willows, and alders. Several beaver dams in this area impound the stream. Shelleberger Creek enters the stream approximately halfway between Detention Pond 1 and the hatchery (Figure 1). In some areas stream flow is slow and bottom substrates are primarily mud and organic muck. Downstream of the hatchery, Willow Creek is extensively braided with multiple bifurcations formed by recently deposited sediments. Riparian areas are mixed coniferous and deciduous forested wetland.

In the third reach, the stream gradient increases as the stream flows past the Deer Creek Hatchery. At the hatchery, the stream is approximately 10 feet wide and 6 inches to 1 foot deep (Photo 6). Instream habitats are primarily glides and riffles separated by small pools. Large woody debris is relatively limited, but the wood that was observed in the stream channel was positioned within pools and provided a high degree of cover. Dense riparian shrub and tree cover provide additional cover. Substrates in this reach of stream are generally sand and small gravels. Cobbles and angular riprap are present in the stream immediately downstream of the weir that diverts water from Willow Creek to the hatchery. Upstream of the hatchery, Willow Creek passes under Pine Street via a corrugated metal culvert and exits the site. Upstream of Pine Street, Willow Creek flows through residential neighborhoods in the City of Woodway. Habitat upstream of the site is largely riffle habitat with limited pools (CH2M HILL, 2003).



Willow Creek and Shelleberger Creek are known to contain coho salmon, chum salmon, cutthroat trout, stickleback, and sculpin. Willow Creek has occasionally supported use by adult chinook salmon as a result of accidental releases from the Deer Creek Hatchery. However, chinook are not normally found in Willow Creek because Willow Creek does not provide suitable habitat for chinook, the stream is too small, and it lacks spawning substrates. Use at Willow Creek and Shelleberger Creek by coho salmon is also supported by accidental releases from the Hatchery and adult coho returns from a coho net pen project at the Edmonds Fishing Pier, sponsored by the Washington Council of Trout Unlimited. Since 1979, approximately 30,000 coho salmon smolts have been held in the net pens to allow them to imprint to return to local waters. As a result, an average of 80 coho adults enter Willow Creek to spawn annually from October through February (Thompson, personal communication, 2002). Between 30 and 100 coho adult salmon have been observed holding at the mouth of the stream waiting for a high tide or high water to enter Willow Creek. River otter have been observed feeding on the waiting adults and on the dead and dying carcasses of spent fish.

Access to spawning habitat in Willow Creek is restricted due to many barriers. Spawning adults require a high tide to swim past an open tidal gate at Marina Beach. Once the adults pass the tidal gate they require high flows associated with rain storms to migrate past the braided channel and spawn in the stream between the hatchery and Pine Street. Adult salmon do have access above the hatchery weir when the boards that divert flows to the hatchery are removed in mid-June each year; however, the culvert at Pine Street is a barrier to fish migration upstream (CH2M HILL, 2003).

### **Shelleberger Creek**

Shelleberger Creek originates in a residential area near 8th Avenue and Elm Street then flows for approximately 1 mile before joining with Willow Creek on the site (Figure 1). Within the site proximity, Shelleberger Creek is a small stream (varies from 2 to 6 feet in width) that flows into Edmonds Marsh north of the Unocal site. Through Edmonds Marsh, Shelleberger Creek flows through a moderately incised, poorly defined channel.

No fish use information has been identified specific to Shelleberger Creek, but fish use in the Edmonds Marsh area of the stream is anticipated to be similar to that in lower portions of Willow Creek from the braided channel sections to the tide gates. This includes coho salmon, chum salmon, cutthroat trout, stickleback, and sculpin.

### **Marine Nearshore**

Adjacent to the Unocal site, marine nearshore habitat includes the outlet of the Willow Creek culvert and the nearshore environment surrounding the Unocal pier. Macroalgae, primarily *Ulva* and *Enteromorpha*, are prevalent in large patches on both sides of the Unocal pier, while eelgrass beds are small and sparse (City of Edmonds, 1998). Nearshore substrates consist of sand, gravel, rock, and glacial till (Photo 10). A flock of brant and numerous gulls were observed foraging and other waterfowl, shorebirds, and marine mammals, invertebrates, and fish are also expected. More information on marine nearshore habitats can be found in the outfall section of Chapter 7 in the Final EIS.

## Special Status Species

Special status species include species designated by federal or state government agencies (U.S. Fish and Wildlife Service, NOAA Fisheries, and WDFW) as endangered, threatened, proposed, candidate, sensitive, and monitor species. Also included are species of local importance designated by King County. Up to 25 special status species may exist on the Unocal site; however only 11 of these species are likely to be found on the site. The 11 special status species likely to occur on the site, in habitat types other than only the marine nearshore, are discussed in the following paragraphs. A discussion of the remaining species and their likelihood of occurring on the site is summarized in Table 2, immediately following the discussions of special status species likely to occur on the site.

### Threatened and Endangered Species

The **bald eagle** is listed as a federal and state threatened species. Bald eagles are both residents in and migrants through Puget Sound. Eagle populations are usually highest in the region in the winter months, when both resident birds and winter migrants are present due to the mild winter climate and abundant fall salmon runs (Stinson et al., 2001). Bald eagles generally perch, roost, and build nests in mature trees near water bodies and available prey, usually away from intense human activity. They prey on a variety of foods including fish, waterfowl, mammals, carrion, and invertebrates. In Puget Sound, waterfowl and fish are generally the most common food for eagles (Watson, 2002). Bald eagles typically return to one of several nests located within an established nesting territory (Stalmaster, 1987). Their seasonal home range for foraging and nesting averages 1.8 square miles in this region (Watson, 2002).

Bald eagles forage in Puget Sound and the Edmonds Marsh, and potential nesting habitat is found in forested habitats on the site. Trees on the Unocal site provide perch sites for bald eagles. The closest documented bald eagle nests off the site are located approximately 1.5 mile north and 0.5 mile south of the Unocal site near Puget Sound (WDFW, 2003).

### Candidate and Sensitive Species

The **pileated woodpecker** is a state candidate species. Pileated woodpeckers are relatively common in Puget Sound in forest habitat, especially where large tree snags, important to the species for foraging and nesting, are abundant. This species excavates cavities in tree snags or live trees with dead wood at least 12 inches in diameter for roost and nest sites (Rodrick and Milner, 1991). Locating specific nest sites from year-to-year is difficult because pileated woodpeckers do not usually return to the same nest tree in successive years. Pileated woodpeckers forage on large snags (larger than 20 inches), logs (larger than 7 inches), and stumps, primarily in forests more than 40 years old. They will also forage in riparian hardwoods and immature forest stands (Rodrick and Milner, 1991).

During field investigations in April 2002, Adolfson observed pileated woodpecker excavations on numerous tree snags in the forested areas on the Unocal site. Although no nests have been recorded or observed on the site, this species may nest in forested habitat on the south portion of the site.

**Vaux's swift** is a state candidate species that may be found foraging on flying insects in forested habitats and above open water habitats. Vaux's swifts usually nest in dead trees, and occasionally in chimneys. Vaux's swift is common in the Seattle area and suitable habitat exists in residential areas (Smith et al., 1997). Although no nests have been recorded in the site vicinity, Vaux's swift is likely to forage above the Unocal site and it may nest in wetland or upland forests on or offsite where large tree snags are present.

Puget Sound **coho salmon** are federal candidate species. Adult coho salmon spawn in freshwater streams in the late fall and early winter. Coho typically spawn in low gradient riffles with clean substrates ranging from pea-sized gravels to orange-sized cobbles (Henry, 1995). Rearing juveniles prefer off-channel pools with complex cover including both large and small woody debris (Henry, 1995). Juvenile coho rear in fresh water for a year to 18 months.

Coho are found in Willow and Shelleberger Creeks. The current run of coho salmon is supported by accidental releases from the Deer Creek Hatchery and adult coho returns from a net pen project at the Edmonds Fishing Pier (Thompson, personal communication, 2002). Spawning opportunities in Willow Creek and Shelleberger Creek, however, are restricted due to human-made barriers, beaver dams (Willow Creek), and unsuitable spawning substrate.

### Monitor

The **great blue heron** is a state monitor species. Two great blue heron colony nesting sites have been observed on the Unocal site by WDFW in 1997 and 1998. One colony was located on the forested slope and one in the Edmonds Marsh. These sites consisted of six nests in 1997 and three nests in 1998. Whether these nests were active or not during these years was not confirmed, though the nests in 1998 did not appear to be active (WDFW, 2003). In 2002, no active nests or adult birds were observed at either site by Tom Cyra from WDFW (Brookshire, personal communication, 2002). Great blue herons are still commonly observed foraging in the Edmonds Marsh and marine nearshore habitats, and up to 17 herons have been observed roosting on the site in recent years (WDFW, 2003).

The **green heron** is a state monitor species. This species is an uncommon inhabitant of freshwater wetlands in Western Washington (Smith et al., 1997). The green heron feeds on small fish and invertebrates in shoreline areas. It is a colony nester, nesting near wetlands or shoreline areas in shrubs or trees (Terres, 1995). The Edmonds Marsh may provide breeding and foraging habitat for green herons; however, no colonies are known to exist in Edmonds Marsh (WDFW, 2003).

The **osprey** is a state monitor species. Osprey forage nearly exclusively on fish and are closely associated with open water habitats. Osprey nest on trees, on utility poles, or on constructed platforms near water (Terres, 1995). No osprey nests are located in the site vicinity along Puget Sound shoreline (WDFW, 2003). Osprey are likely to be found foraging in the marine nearshore and salt marsh habitats on and adjacent to the site.

**Long-eared myotis** and **long-legged myotis** are state monitor species. These bats forage on insects in a variety of habitat types, although they are commonly sighted foraging over forest openings and open water. These bats will roost beneath tree bark, in buildings, caves, or mines

(Christy and West, 1993). According to Bats Northwest (2000), these species are likely to be found in Puget Sound Lowlands. These bat species may forage over open water and forest openings on the Unocal site, and they may roost beneath tree bark on snags and live trees on the site.

### Species of Local Importance

King County considers the **red-tailed hawk** to be a species of local importance; however, this species does not have special status in Washington State or in Edmonds. They are no longer considered a special status species by WDFW because their populations are rising (Smith et al., 1997). Red-tailed hawks are protected at the state and federal level under the federal Migratory Bird Treaty Act. Red-tailed hawks prefer a mix of forest and open grassland habitats for nesting and foraging. They nest in trees and will defend the same nesting territory in successive years (Terres, 1995). They prey on small mammals, birds, and reptiles (Fitch et. al, 1946).

Upland forest on the site provides potential nesting habitat for red-tailed hawks, and the Edmonds Marsh provides ample foraging opportunities. This species is likely to occur on the site. However, no red-tailed hawk nests have been observed during field surveys, and none are known to exist on the site.

### Federal Species of Concern

Several species listed as federal species of concern also may be found on the Unocal site. These species may be designated in the future as endangered, threatened, or candidate if this is deemed necessary by USFWS for sustaining these species at the federal level. Federal species of concern include the **willow flycatcher**, **olive-sided flycatcher**, **red-legged frog**, **Yuma myotis**, and **Pacific lamprey**. These species may occur in riparian, wetland, and forest habitats on the site. The willow flycatcher may forage or breed in riparian-wetland habitats on the site.

## Limitations

Within the limitations of schedule, budget, and scope-of-work, we warrant that this study was conducted in accordance with generally accepted environmental science practices, including the technical guidelines and criteria in effect at the time this study was performed, as outlined in the Methods section. The results and conclusions of this report represent the authors' best professional judgment, based upon information provided by King County and others in addition to that obtained during the course of this study. No other warranty, expressed or implied, is made.

**Table 2. Other Special Status Species Less Likely to Occur on the Site**

<b>Common Name</b>	<b>Federal Status, State Status</b>	<b>Onsite Habitat</b>	<b>Likelihood of Occurrence</b>
Bull Trout	Federal Threatened	Marine nearshore habitat for foraging, Willow Creek lacks clean cold water, pools, and large woody debris required for this species.	Limited likelihood to occur only seasonally in marine nearshore habitat.
Puget Sound Chinook Salmon	Federal Threatened	Marine nearshore habitat for foraging, Willow Creek is too small and does not have sufficient holding pools for this species.	Limited likelihood to occur only seasonally in marine nearshore habitat.
Marbled Murrelet	Federal Threatened	Offshore habitat for foraging near the site, nesting habitat is lacking except for a few tall conifers near the Deer Creek Hatchery.	Foraging offshore, not on the site.
Steller's Sea Lion	Federal Threatened	Marine nearshore habitat for foraging.	Limited to marine nearshore habitat for foraging.
Oregon Spotted Frog	Federal Candidate, State Endangered	Open water and emergent wetland habitats for breeding and foraging.	Not likely to occur here due to this frog's low historical presence and subsequent decline in this region. The closest known population is in the south Puget Sound lowlands.
Western Pond Turtle	State Endangered	Open water and adjacent upland habitats for breeding.	Not likely to occur here because of its rarity in this region. The closest known population has recently been reintroduced at one small pond complex in Pierce County.
Common Loon	State Sensitive	Marine nearshore habitat for foraging.	Limited likelihood for marine nearshore foraging.
Peregrine Falcon	State Sensitive	Would forage for birds in all habitat types on the site.	May forage on the site occasionally, but no nest sites are known to exist on or near the site.
River Lamprey	State Candidate	Spawn in stream riffles in sand and gravel substrates, habitat may occur in Willow Creek or Shelleberger Creek.	Limited likelihood to occur only seasonally in Willow Creek or Shelleberger Creek.
Purple Martin	State Candidate	Marine nearshore and wetland habitats for foraging, if nest boxes were placed on the site, martins may nest here.	Not known to be nesting any closer than one mile from the site; therefore they are unlikely to be found foraging on the site.

Common Name	Federal Status, State Status	Onsite Habitat	Likelihood of Occurrence
Merlin	State Candidate	Could forage in habitats on the site, and forested habitat is available for nesting.	Not likely to occur on the site, except for occasional foraging, because they are rare in this region.
Western Grebe	State Candidate	Marine nearshore for foraging.	Limited to occasional foraging use in the marine nearshore.
Western Toad	State Candidate	Wetland habitats for breeding and adjacent upland forest habitats for foraging and dispersal.	This species is no longer common in the region. Though habitat is available onsite, the likelihood of their occurrence is low due to their recent decline. In addition, wetland habitats on the site are disturbed and surrounded by urban habitats.
Keen's Myotis	State Candidate	Roosting habitat exists in upland and wetland forest habitats, and foraging opportunities are found in all habitat types.	Not likely to occur on the site because this species is not common.
Western Big-eared Bat	State Candidate	Foraging opportunities are available in all habitat types on the site.	Not likely to occur because potential breeding, roosting, and hibernation sites are not available on the site.

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## **FIGURES AND PHOTOS**





**Habitat Types**

- Developed Area
- Upland Forest
- Upland Shrub
- Forested/Scrub-Shrub Wetland
- Saltwater Marsh (Estuary)
- Emergent Wetland
- Open Water
- Marine Nearshore
- Stream
- Piped Stream Section
- Site Boundary

May 2003





Photo 1. Site overview of developed areas and Edmonds Marsh, view north from the former tank sites (May 14, 2002).



Photo 2. Upland forest near the Deer Creek Hatchery (April 11, 2002).





Photo 3. Upland shrub and forest near the shoreline (April 11, 2002).



Photo 4. Edmonds Marsh and Willow Creek, view north from the site (May 14, 2002).





Photo 5. Willow Creek and the permanently open tide gate, view northwest (May 14, 2002).



Photo 6. Forested wetland habitat and Willow Creek in Edmonds Marsh near the Deer Creek Hatchery (April 11, 2002).





Photo 7. Open water, emergent, and scrub-shrub wetland habitats in Wetland B, view south (May 14, 2002).



Photo 8. Wetland C, a groundwater seep dominated by giant horsetail and salmonberry (May 14, 2002).





Photo 9. Willow Creek upstream from the tide gate and adjacent to the berm separating Wetland B from the Edmonds Marsh (Wetland A) (May 14, 2002).



Photo 10. Marine nearshore habitat north of the site (April 11, 2002).